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africanae XLVI" several new species are described, and the following new genera are proposed: *Isoberlinia* and *Paradaniellia* of the Leguminosae, and *Klaineanthus* and *Hamilcoa* of the Euphorbiaceae.—J. M. GREENMAN.

Recent work among Filicales.—DAVIS²³ has investigated the structure of *Peranema* and *Diacalpe*, Asiatic genera of ferns whose relationships have been somewhat doubtful. Both genera are polystelic; and while in *Peranema* the short-stalked sorus is a mixed one, with a receptacle of the Gradatae type and traces of a basipetal succession of sporangia, in *Diacalpe* the mixed sorus shows no traces of basipetal succession. Moreover, in *Peranema* the annulus is slightly oblique, while in *Diacalpe* it "is vertical in insertion, but slightly twisted in its course across the sporangial head." Both show relationships to species of *Nephrodium*, but are most nearly related to *Woodsia* and *Hypoderris*, and fall naturally into the Woodsiae-Woodsiinae group of Polypodiaceae," a group that is regarded as intermediate between Cyatheaceae and the Aspidieae. The conclusion is suggested that the *Aspidium* forms have come from a Gradatae ancestry, and "that *Peranema* and *Diacalpe* are relatively early members of a phyletic drift to the Polypodiaceae."

BOWER²⁴ has used a study of *Alsophila* (*Lophosoria*) *pruinata* as the basis for a discussion of an important phyletic sequence. *Lophosoria* is shown to be a more primitive type than the true species of *Alsophila* and worthy of generic separation from that genus. The phyletic relations with *Struthiopteris*, *Onoclea*, *Cystopteris*, *Acrophorus*, *Peranema*, *Diacalpe*, *Woodsia*, and *Hypoderris* are discussed and the following "progressions" announced: (1) the frequent dichotomous branching in Gleicheniaceae becomes rarer in the higher types, and the creeping axis of the earlier forms becomes ascending or erect in some of the later ones"; (2) "the peculiarities of the original gleicheniaceous type of leaf are shown in reminiscent details in the Cyatheaceae, but lost elsewhere"; (3) progression from primitive hairs to scales; (4) progression from the proto-stele of § MARTENSIA of *Gleichenia* to the solenostele of *G. pectinata* and *Lophosoria*, and the polystele of all other members of the series; (5) progression from the Simplicies type of sorus (*Gleichenia* and *Lophosoria*) to the Gradatae type in Cyatheaceae, and finally to the Mixtae type in *Hypoderris*, *Peranema*, and *Diacalpe*, "a condition leading probably to that of the Aspidieae"; (6) progression from a larger spore-output and an oblique annulus to a smaller output and a vertical annulus; (7) progression from a larger sperm-output to a smaller one.

This series is believed by BOWER to constitute a true phylum, a phylum quite distinct from that of the ferns with originally marginal sori. The prob-

²³ DAVIS, R. C., The structure and affinities of *Peranema* and *Diacalpe*. Ann. Botany **26**: 245-268. pls. 28, 29. 1912.

²⁴ BOWER, F. O., Studies in the phylogeny of the Filicales. II. *Lophosoria*, and its relation to the Cyatheoideae and other ferns. Ann. Botany **26**: 269-323. pls. 30-36. 1912.

able phyletic sequence of families, therefore is as follows: "Gleicheniaceae, Cyatheaceae (with minor groups, e.g., Woodsieae, etc.), Aspidieae."

Miss HUME²⁵ has investigated the sieve tubes of *Pteridium aquilinum*, and compared them with those of *Lygodium dichotomum* and *Marsilia quadrifolia*. The xylem has long received intensive study on account of its service in conclusions concerning phylogeny; but there are symptoms that the phloem is now beginning to come into its own. The stock contrasts between the sieve tubes of pteridophytes and spermatophytes are now beginning to break down and Miss HUME has contributed her share to this process. Not only does callus appear, as RUSSOW showed, but the author shows that the pores are not closed. "The outstanding differences are in shape and contents; the sieve tubes of vascular cryptogams are larger and thicker walled and contain refringent granules." The larger size and thicker walls are thought to be associated with the fact that the sieve tubes of pteridophytes (on account of the absence of secondary thickening) have to function for a long time, in some cases for as much as 20 years, while in some dicotyledons and gymnosperms they are renewed each year. The time is at hand when the sieve tubes can be linked up in phyletic sequences as the xylem elements have been.

THOMAS²⁶ has discovered in the Jurassic of Yorkshire sporangia of *Coniopteris hymenophylloides* Brongn. and *Todites Williamsoni* Brongn., which support the view that the former species is closely related to the modern Cyatheaceae, and which furnish for the latter species additional points of resemblance to the modern *Todea*. Fertile material of *Cladophlebis lobifolia* Phill. was also secured, which justifies its removal from the form-genus and its provisional placing in a new genus *Eboracia*, related in sori and spores to *Coniopteris*, but very distinct in the form of the fertile fronds.—J. M. C.

American cecidology.—All students of the biological sciences will be interested in the increased attention which cecidology is receiving in America, and also in the fact that it is being studied by both entomologists and botanists. FELT presents four papers. In the first²⁷ he gives a very complete list of plants on which the cecidia of our American gall midges are known to occur and the names of the gall-makers. Our knowledge of this group of gall-makers is very indefinite, and therefore the very brief one-line descriptions may appear unsatisfactory to many who are unfamiliar with the subject. However, the list will prove of very great value to the student of plant pathology and cecidology. In a second paper²⁸ FELT describes 17 new species of gall midges,

²⁵ HUME, E. M. MARGARET, The history of the sieve tubes of *Pteridium aquilinum*, with some notes on *Marsilia quadrifolia* and *Lygodium dichotomum*. Ann. Botany 26: 573-587. pls. 54, 55. 1912.

²⁶ THOMAS, H. HAMSHAW, On the spores of some Jurassic ferns. Proc. Cambridge Phil. Soc. 16: 384-388. pl. 3. 1911.

²⁷ FELT, E. P., Hosts and galls of American midges. Jour. Econ. Entomology 4: 451-475. 1911.

²⁸ ———, New species of gall midges. Ibid. 4: 476-484. 1911.